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Model 403

Surface Mount Quartz Crystal

FEATURES

- Standard 3.2x2.5mm Surface Mount Footprint
- Stable Frequency Over Temperature and Drive Level
- Frequency Range 12 – 50 MHz
- Frequency Tolerance, ±30 ppm Standard (±10 ppm, ±15 ppm and ±20 ppm available)
- Frequency Stability, ±50 ppm Standard (±10,±15,±20,±30 and ±40 ppm available)
- Operating Temperature to –40°C to +85°C
- Tape & Reel Packaging, EIA-481-2 Compliant
- **RoHS/Green Compliant (6/6)**

DESCRIPTION

The Model 403 is a ceramic packaged Crystal offering reduced size, ideal for high-density circuit board applications. The Model 403 offers reliable precision and excellent shock performance in wireless telecommunication devices.

ORDERING INFORMATION

403 ☐☐☐☐☐☐ M ☐☐☐☐☐

OPERATING TEMPERATURE RANGE

C = -20°C to +70°C (standard)
I = -40°C to +85°C

FREQUENCY TOLERANCE @ 25°C

1 = ± 10 ppm
X = ± 15 ppm
2 = ± 20 ppm
3 = ± 30 ppm (standard)

STABILITY TOLERANCE

Over Operating Temperature Range (Referenced to 25°C Reading)

1 = ± 10 ppm **	3 = ± 30 ppm
X = ± 15 ppm	4 = ± 40 ppm
2 = ± 20 ppm	5 = ± 50 ppm (standard)

** Limited to Standard Operating Temperature Range Only; Code C.

FREQUENCY IN MHz

M - indicates MHz and decimal point. Frequency is recorded with minimum 5 significant digits to the right of the "M".

LOAD CAPACITANCE

A = 10 pF	G = 30 pF
B = 13 pF	H = 32 pF
C = 16 pF	J = 9 pF
D = 18 pF	K = 8 pF
E = 20 pF	L = 12 pF
F = 24 pF	S = Series

Example Part Numbers:
403C35A14M31818
403I35A32M00000

Use form C052 to detail non-standard parameters.

Not all performance combinations and frequencies may be available.
Contact your local CTS Representative or CTS Customer Service for availability.

• • • CTS Electronic Components, Inc. • 171 Covington Drive • Bloomingdale, IL 60108 • • •
• • • www.ctscorp.com • • •

ELECTRICAL CHARACTERISTICS

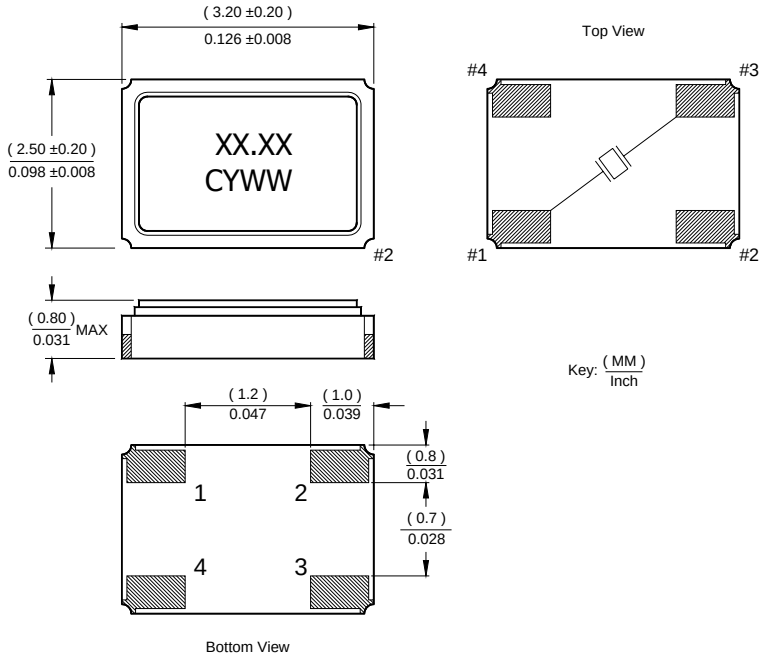
	PARAMETER	VALUE
Electrical Parameters	Operating Mode	Fundamental
	Crystal Cut	AT-Cut
	Frequency Range	12.0 MHz to 50.0 MHz
	Frequency Tolerance @ 25°C	± 30 ppm Standard (± 10 ppm, ± 15 ppm and ± 20 ppm Available)
	Frequency Stability Tolerance (Operating Temperature Range, Referenced to 25°C Reading)	± 50 ppm Standard (± 10 ppm, ± 15 ppm, ± 20 ppm, ± 30 ppm and ± 40 ppm Available)
	Operating Temperature Range	-20°C to +70°C Standard (-40°C to +85°C Available)
	Aging	± 3 ppm/year Maximum
	Storage Temperature Range	-55°C to +125°C
	Equivalent Series Resistance	See ESR Table
	Load Capacitance or Resonance Mode	See Ordering Information
	Shunt Capacitance (C_0)	5.0 pF Maximum (3.0 pF Typical)
	Drive Level	10 µW Typical, 100 µW Maximum
	Reflow Condition, per JEDEC J-STD-020	+255°C ± 5°C, 10 Seconds Maximum

EQUIVALENT SERIES RESISTANCE TABLE

FREQUENCY RANGE	MODE of OSCILLATION	ESR Maximum
12.00 MHz - 13.999 MHz	Fundamental	150 Ohms
14.00 MHz - 15.999 MHz	Fundamental	100 Ohms
16.00 MHz - 19.999 MHz	Fundamental	80 Ohms
20.00 MHz - 50.00 MHz	Fundamental	60 Ohms

MECHANICAL SPECIFICATIONS

PACKAGE DRAWING



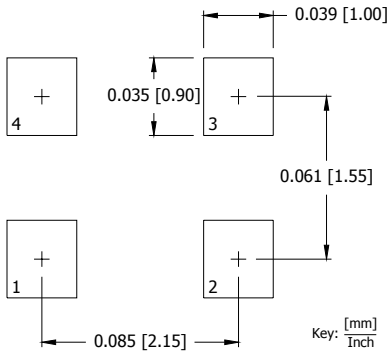
MARKING INFORMATION

1. XX.XX – Frequency marked with 2 significant digits after the decimal.
2. C – CTS and Pin 1 identifier.
3. YWW – Date Code, Y – Last Digit of Year, WW – Week.
4. Complete CTS part number, frequency value and date code information must appear on reel and box labels.

NOTES

1. Termination pads (e4), barrier-plating is nickel (Ni) with gold (Au) flash plate.
2. Terminations #2, #4 and the metal lid are connected internally. End user may connect these pins to circuit ground.

SUGGESTED SOLDER PAD GEOMETRY



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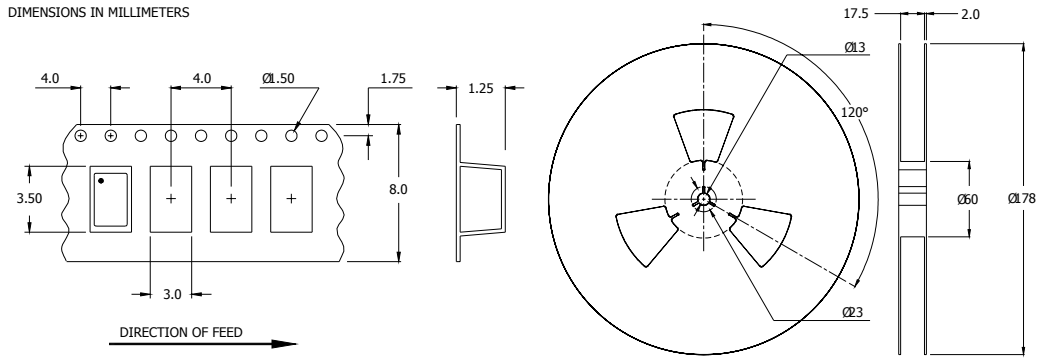
TAPE AND REEL INFORMATION



Device quantity is 3,000 pieces minimum per 178mm reel.

ENVIRONMENTAL SPECIFICATIONS

Temperature Cycle:	400 cycles from –55°C to +125°C, 10 minute dwell at each temperature, 1 minute transfer time between temperatures.
Mechanical Shock:	1,500g's, 0.5mS duration, ½ sinewave, 3 shocks each direction along 3 mutually perpendicular planes (18 total shocks).
Sinusoidal Vibration:	0.06 inches double amplitude, 10 to 55 Hz and 20g's, 55 to 2,000 Hz, 3 cycles each in 3 mutually perpendicular planes (9 times total).
Gross Leak:	No leak shall appear while immersed in an FC40 or equivalent liquid at +125°C for 20 seconds.
Fine Leak:	Mass spectrometer leak rates less than $2x10^{-8}$ ATM cc/sec air equivalent.
Resistance to Solder Heat:	Product must survive 3 reflows of +260°C peak, 10 seconds maximum.
High Temperature Operating Bias:	2,000 hours at +125°C, disregarding frequency shift.
Frequency Aging:	1,000 hours at +85°C, maximum ±5 ppm shift.
Insulation Resistance:	500M Ohms @ $100V_{DC}$ $\pm15V_{DC}$.
Moisture Sensitivity Level:	Level 1 per JEDEC J-STD-020.

QUALITY AND RELIABILITY

Quality systems meet or exceed the requirements of ISO 9000:2000 standards.